**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
REGION 4
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October 24, 2013

Mr. Eric Gasch
Planning and Environmental Branch
U.S. Army Corps of Engineers
Wilmington District
69 Darlington Avenue
Wilmington, North Carolina 28403

**Subject: EPA NEPA Review Comments on Wilmington District's DEIS "Integrated Feasibility Report and Draft Environmental Impact Statement (DEIS) Bogue Banks Coastal Storm Damage Reduction Project"; CEQ #20130238**

Dear Mr. Gasch:

The U.S. Environmental Protection Agency (EPA) has reviewed the subject U.S. Army Corps of Engineers' (Corps) Draft Environmental Impact Statement (DEIS) in accordance with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. It is our understanding that the Corps initiated this study and subsequent DEIS to evaluate coastal storm damage reduction at Bogue Banks, a 25.4-mile long barrier island located on North Carolina's central coast in Carteret County.

The Corps indicates that this Feasibility study and DEIS identifies a National Economic Development (NED) plan, which is the plan that maximizes net benefits to the nation through reduction of future storm damages. The NED plan consists of an 119,670 ft (22.7 miles) long main beach fill, with a consistent berm profile across the entire area, and dune expansion in certain portions (approximately 5.9 miles of the project).[1]

The EPA was invited to and participated in multiple project delivery team (PDT) meetings associated with this project over the past several years. We appreciate the Corps efforts to coordinate with the Region on this project. We also appreciate the Corps granting additional time to provide comments and allow for discussion with the District on the proposed project.

Based on our analysis of the above referenced proposed action, EPA rates this DEIS as **"EC-2" i.e., EPA has "Environmental Concerns and Request Additional Information"** in the Final EIS (FEIS). The EPA's rating system criteria can be found online at: http://www.epa.gov/oecaerth/nepa/comments/ratings.html.

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[1] p. i of Executive Summary of DEIS

Our primary concerns associated with the proposed action are consideration of impacts on federally listed species, prediction of future beach renourishment needs, disclosure of current water quality conditions, potential impacts to hard bottom areas in the borrow areas, disclosure of causes of erosion along the island, timeline of the proposed action, and the need for an environmental justice analysis in the DEIS. Detailed comments are enclosed with this letter which more clearly identifies our concerns and comments. We request that a dedicated section of the FEIS include specific responses to our comments.

EPA appreciates the opportunity to review the DEIS. Should the Corps have questions regarding our comments, please feel free to contact Dan Holliman of my staff at 404/562-9531 or holliman.daniel@epa.gov.

Sincerely,

Ramona K McConney for

Heinz J. Mueller
Chief, NEPA Program Office
Office of Environmental Accountability

Attached: EPA Detailed Comments

cc: Kathy Matthews, USFWS, Raleigh Field Office

**U.S. EPA DETAILED COMMENTS**
**ON THE INTEGRATED FEASIBILITY REPORT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT COASTAL STORM DAMAGE REDUCTION BOGUE BANKS, CARTERET COUNTY NORTH CAROLINA**
**FOR THE U.S. ARMY CORPS OF ENGINEERS WILMINGTON DISTRICT**

**BACKGROUND:**
The Draft Environmental Impact Statement (DEIS) and Feasibility Report was prepared by the U.S. Army Corps of Engineers (Corps) for a proposed coastal storm damage reduction project for Bogue Banks. Bogue Banks extends from Beaufort Inlet in the East to Bogue Inlet in the West. Bogue Banks includes the communities of Fort Macon, Atlantic Beach, Pine Knoll Shores, Indian Beach/Salter Path, and Emerald Isle. EPA understands that the Corps initiated this study and subsequent DEIS to evaluate coastal storm damage reduction at Bogue Banks, a 25.4-mile long barrier island located on North Carolina's central coast in Carteret County. It is also our understanding that the Corps' ultimate goal of the project is to formulate the beach maintenance plan for Bogue Banks over the next 50 years that maximizes net economic benefits and is feasible from both an environmental and constructability standpoint.

**ALTERNATIVES PROPOSED:**
Multiple alternatives were considered in the DEIS, including structural measures like beach fill measures, groins, seawalls and revetments, breakwaters, vegetation, sand fencing. Nonstructural measures considered in the DEIS included regulatory measures and removal of threatened beachfront properties.

The Corps indicates in the DEIS that only the no action, regulatory measures, demolition non-structural measure and beach fill structural measures were forwarded in the plan formulation process and considered for more detailed evaluation. In addition, the Corps indicates in the DEIS that the structural (beach fill) and non-structural measures can be applied independently and in combinations with each other to develop alternative plans.

**THE TENATIVELY SELECTED PLAN (TSP):**
The Corps indicates that this Feasibility study and DEIS identifies a National Economic Development (NED) plan, which is the plan that maximizes net benefits to the nation through reduction of future storm damages. The NED plan consists of 119,670 ft (22.7 miles) long main beach fill, with a consistent berm profile across the entire area, and dune expansion in certain portions (approximately 5.9 miles of the project).[1]

This plan provides an estimated average annual $11,511,000 in coastal storm damage reduction benefits and $3,432,000 in recreation benefits, at an average annual cost of $6,583,500 a year, and has a Benefit Cost Ratio of 2.3 to 1. In addition, if implemented the project would also

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[1] p. i of Executive Summary of DEIS

enhance the beach area available for recreation use and provide and maintain habitat for a variety of plants and animals. [2]

The estimated first cost of the plan is $37,469,000, which would be cost-shared 65% Federal and 35% non-Federal. The project includes a 3-year nourishment cycle (16 total nourishments) with an estimated cost of $14,370,000 per nourishment. Total cost for nourishments over the 50 year life cycle of the project is $229,920,000. Nourishments would be cost shared at 50% Federal and 50% non-Federal. Beach fill monitoring is estimated at $187,500 per year and $9,375,000 over the 50 year life cycle of the project and would be cost shared at 50% Federal and 50% non-Federal. The total cost per year for the general repair, maintenance, and inspection of the project is estimated at $75,000 per year and $3,750,000 with 100% paid by non-Federal project sponsor[3]. The Corps states that the total project cost for the 50 year life cycle is $267,395,000 in current dollars.[4]

**EPA COMMENTS:**

Project Need and Causes of Erosion

Causes of erosion and project need should be more clearly identified and discussed in the FEIS. EPA recommends adding additional information in the FEIS related to property damage and beach erosion issues due to actual past storms events. Providing such information would better support the project need statement. EPA is unclear from the DEIS if storms are the sole cause of erosion on the island or if other causes of erosion exist. EPA recommends that the causes of erosion on Bogue Banks be fully discussed in the FEIS.

Economics

Appendix B provides tables describing the average annual remaining damages, cost and benefits by reach for all alternatives including the TSP, Alternative 9. Based on this table the total average annual net benefit from the TSP will be $7,916,625. This estimate includes potential positive benefits from protection of structures, prevention of loss of property, minimizing loss of recreation, etc.

The Corps states in Appendix B that "The average annual present value of coastal storm damages over the 50-year period of analysis without a damage reduction project totals $17,304,000 ($14,556,000 in structure and content damage and $2,748,000 in land loss) in October 2011 price levels."[5]

**EPA Recommendation:** EPA recommends providing additional details from actual storm events in the economic report for the FEIS that support these average annual damage estimates.

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[2] p. i of Executive Summary of DEIS
[3] Project cost estimates derived from Table 8.3 of DEIS
[4] p. 173 of DEIS – see comments below regarding total project cost discrepancies
[5] p. Appendix B-14

Examples of information that would help the reader better understand historical impacts from storms could be; 1) property and infrastructure damage estimates 2) days of recreation lost, and 3) areas of the island that were inundated by previous storm events.

Project Cost and Benefits

The Corps estimates total project cost for the 50 year life cycle is $267,395,000 in current dollars.[6] EPA notes that the average annual cost estimate for the TSP (Alternative 9) is significantly less than the cost estimate for Alternative 9 in Table 6.3. We note that these cost estimates appear to be based on different price level years, but the difference is significant. EPA also notes that if the average annual cost of the project presented in Table 6.3 is multiplied over the life of the project the total cost is significantly different from the total cost estimate provided on p. 173 of the DEIS. EPA notes that this may be due to interest and amortization, but this is unclear in the document.

**EPA Recommendation:** The DEIS appears to provide for multiple average annual project costs and total project cost for the TSP (Alternative 9). EPA recommends the Corps clarify the total project cost and average annual project cost in the FEIS. We also recommend that the Corps clearly state which total project cost and/or average annual cost the benefit cost ratio is based on in the FEIS.

Water Quality

EPA notes that the proposed project has the potential to impact water quality, however, the Corps suggest that the Bogue Banks project would have minimal impact on water quality. EPA concurs that the potential for significant water quality impacts for the proposed action are low, however we are concerned about the level of baseline data and information that is conveyed in the DEIS regarding water quality. Section 2.02 – Water Resources – appears to summarize surface water classifications in North Carolina and the CWA 303(d) programs. Minimal information is provided regarding the current water quality condition of Bogue Sound, Bogue Inlet, White Oak River, Newport River, and Beaufort Inlet. In addition, no information is provided in the DEIS relating to currently permitted NPDES discharges and there is no discussion regarding wastewater effluent, treatment facilities (septic/municipal, types, locations, etc.) from homes and businesses. EPA believes this information is very important and should be provided in this document.

**EPA Recommendation:** EPA recommends the Corps provide significantly more information in the FEIS regarding existing water quality for Bogue Sound, Bogue Inlet, White Oak River, Newport River, and Beaufort Inlet. This additional information should include but not be limited to recent water quality assessments of these areas, maps of sampling locations, and existing water quality classifications of potently impacted waters. Furthermore, we recommend that additional information be provided in the FEIS regarding existing permitted NPDES discharges and wastewater treatment facilities and infrastructure in the project area. Significant storms have

[6] Total project cost estimates from p. 173 of DEIS

the potential of damaging this infrastructure which can cause runoff to marine and sound waters of bacteria and other pollutants that can cause public health issues following storm events. If the proposed project provides protection for this infrastructure then it should be disclosed in the FEIS.

Selection of Least Environmentally Damaging Practicable Alternative (LEDPA)

EPA understands that the proposed project must comply with the requirements of our regulations pursuant to the Clean Water Act (CWA) Section 404(b)(1) Guidelines ("Guidelines"; 40 C.F.R. 230). The Corps provides a 404(b) Analysis in Appendix K of the DEIS. Based on our assessment of Appendix K and the main document of the DEIS it is unclear on how the Corps came to the conclusion that the proposed project is the LEDPA. The LEDPA is not identified in the main document of the DEIS in the context of the multiple alternatives presented.

**EPA Recommendation:** EPA recommends the Corps provide significantly more information in the FEIS on how the TSP meets the CWA Section 404(b)(1) Guidelines ("Guidelines"; 40 C.F.R. 230). The rationale of how the LEDPA was determined in the context of the other alternatives presented in the DEIS should be provided in the FEIS. Actions to avoid and minimize adverse impacts to the environment should be included in this additional information in the FEIS. In addition, it is also unclear from the DEIS if the Corps considers the TSP, Alternative 9, as the "environmentally preferable alternative"[7], therefore EPA also encourages the Corps to identify the environmentally preferable alternative in the FEIS.

Length of Project

EPA is concerned with the length of the project (50-year project period) because so much could change environmentally and economically over such a long period of time. After a number of years of borrow site use, monitoring of the sediments and trends in offshore borrow site topography could indicate substantial changes occurring to the island and the near-shore environment. If unexpected erosion loss of borrow site sediment is detected, it could necessitate major revisions to the long term shoreline maintenance plan. From a biological perspective, increased knowledge and trends of fish migrations, turtle nesting, and shore bird nesting behavior could also require modification of the proposed maintenance plan. The plan, therefore, should have required periodic adaptive management. The only reference in the DEIS to adaptive management can be found on p. 58, "Adaptive management plans formulated to address project uncertainties also have to be considered."

**EPA Recommendation:** EPA recommends the Corps provide a clear adaptive management strategy in the FEIS that includes performance and/or success criteria that will adequately capture the dynamic nature of the proposed project and help direct any future changes to the project that may be needed to avoid and minimize impacts to the environment.

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[7] NEPA Section 101

Estimated Material for Project

Figure 1.2 provides a clear visual of historical placement of material on Bogue Banks shoreline between (1978-2010). Based on our calculations the following amount of material has been deposited along the shoreline during the following time periods:

| 1978-1984 | 1985-1991 | 1992-1998 | 1999-2005 | 2006-2010 (5 yrs.) |
|---|---|---|---|---|
| **1,194,600 cy** | **4,254,600 cy** | **4,824,400 cy** | **8,380,533 cy** | **2,238,560 cy** |

The total amount of material deposited over the 33 year period depicted in Figure 1.2 is 20,892,693 cy.

The TSP consists of 119,670 ft (22.7 miles) long main beach fill, with a consistent berm profile across the entire area, and dune expansion in certain portions (approximately 5.9 miles of the project).[8] The Corps states that the TSP will require 2.45 million cubic yards of material during initial construction and approximately 1.07 million cubic yards of material for each renourishment cycle (16 total renourishments planned). The total amount of material needed for this project is estimated at 19.55 million cubic yards for the initial construction all subsequent renourishments.[9] EPA notes that the amount of material proposed for this project over the 50 year life is less than the amount of material that has historically been placed on the Bogue Banks shoreline over a 33 year period. However, after additional discussion with the Corps we understand that there is a significant difference between material disposal activities presented in Figure 1.2. Historically, material used in beach nourishment activities at Bogue Banks has originated from multiple sources (Bogue Inlet AIWW Crossing Disposal, MHC Inner Harbor Maintenance Dredge Disposal, etc.), and these disposal activities may or may not function as storm damage reduction similar to the currently proposed project.

**EPA Recommendation:** We recommend the Corps provide additional discussion in the FEIS about the difference in historical material placement presented in Figure 1.2. Specifically, we recommend the Corps make clear distinctions between storm damage reduction activities and disposal of navigational dredge material that may not provide storm damage reduction benefits. In addition, if historical nourishment activities associate with Bogue Inlet AIWW Crossing Disposal, MHC Inner Harbor Maintenance Dredge Disposal, etc. are to continue through the life of the currently proposed project, we recommend providing additional discussion in the FEIS on how these activities are interrelated with the currently proposed project.

Federally Listed Species

EPA notes that Table 2.4 provides a list of Federal Threatened and Endangered Species potentially present in Carteret County, North Carolina. This table appears to be significantly different from information provided on USFWS's website for the current list of Endangered

[8] p. i of Executive Summary of DEIS

[9] Fill estimates based on p. 77 of DEIS

Species, Threatened Species, Federal Species of Concern, and Candidate Species, Carteret County, North Carolina. USFWS Website:

http://www.fws.gov/raleigh/species/cntylist/carteret.html

EPA notes that the Atlantic Sturgeon, *Acipenser oxyrhynchus oxyrhynchus*, is listed as a Federal Species of Concern. However, EPA notes that the USFWS's website provided above list the Atlantic Sturgeon as Endangered. EPA also notes several species listed on the USFWS website are not listed in Table 2.4.

EPA also notes that the discussion about Piping Plover Critical Habitat is not described fully in text. Figure 2.3 identifies general locations including NC Units 7, 8, 9 and 10. The extent of these areas is not fully described (e.g. linear feet of beach; acreage, etc.). Lastly, discussion concerning a rare butterfly, *Atrytonopsis* sp. *1*, was not fully evaluated in the context of the current survey being conducted for the USFWS.

**EPA Recommendation:** EPA recommends continued coordination with the USFWS. EPA recommends the Corps revise and update Table 2.4 in the FEIS to reflect the current status of federally listed species. EPA also recommends that the linear feet of beach and acreages be provided in the FEIS with respect to piping plover critical habitat. EPA also recommends that the Corps provide additional details about the on-going study of *Atrytonopsis* sp. *1*. Including details in the FEIS about the study such as when the study started, projected completion date, and any interim results would be helpful for reviewers.

Hard Bottom Areas

EPA continues to be concerned with potential impacts to hard bottom areas from off-shore dredging and beach nourishment activities. We continue to recommend rigorous delineation of all hard bottom resources within the proposed borrow areas and fill placement areas to avoid impacts to hard bottom resources. EPA notes that the Corps determined in the DEIS that there are no hardbottom resources in the nearshore zone for the project. However, the Corps indicates that there are hardbottom resources located within Borrow Areas U and Y.[10] The Corps proposes to protect these resources by providing for a 500 meter buffer, but does not provide a citation for scientific study that supports the 500 meter buffer as protective for the hardbottom areas.

**EPA Recommendation:** EPA recommends the Corps revise the FEIS by adding additional data and citations to support the proposed 500 meter buffer for hardbottom areas. Any loss of the existing hard bottom features offshore should be investigated promptly to determine causal factors and appropriate action.

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[10] p. 20 of DEIS

Sand Compatibility

According to a study cited in the DEIS,[11] management strategies recommended to protect surf zone fishes and invertebrates include: (1) project timing, (2) sediment compatibility, (3) nourishment duration, and (4) innovative ways to minimize effects (i.e., staging nourishment events). EPA considers using borrow material that is comparable to the natural beach material is paramount in protecting surf zone fishes and invertebrates and federally listed species. Based on our review of the DEIS, it appears that the Corps has not committed to using the North Carolina Sediment Criteria Rule (15A NCAC 07H.0312: Technical Standards for Beach Fill Projects). EPA continues to support the use of the North Carolina Sediment Criteria Rule. Ensuring the grain size of the dredged material is compatible with existing beach sands will not inhibit turtle and seabird nesting activities and will minimize future beach erosion. Based on discussions with the Corps we understand that the Corps believes the sediment criteria proposed in the DEIS will be protective federally listed species.

**EPA Recommendation:** EPA recommends the Corps provide addition clarification in the FEIS regarding historical beach renourishment activities in North Carolina as they relate to the sand compatibility criteria proposed in this DEIS and impacts on federally listed species. Specifically, if the Corps has conducted species surveys and /or other studies of historical beach nourishment activities using the proposed sand criteria for this project and impacts to species, we recommend the Corps include these in the FEIS.

Nourishment Schedule

Due to the potential impacts of beach nourishment activities on federally listed species, EPA supports a longer period of time between renourishment intervals (currently 3 years is the proposed interval). The Corps provides an analysis in the DEIS that provides a comparison of benefits and cost for the different renourishment intervals.[12] Based on Table 5.10, the difference or delta for the average annual benefits for the 3 year interval vs. the 5 year interval is only $79,000.

**EPA Recommendation:** EPA recommends the Corps provide additional support in the FEIS for selection of the 3 year interval versus a longer renourishment interval which EPA believes would be more protective of federally-listed species.

Consideration of Environmental Justice Impacts

Pursuant to the Executive Order 12898 entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations" and the accompanying Presidential Memorandum, EPA is unable to locate an EJ analysis in the DEIS with the exception of a no effect determination provided in table 5.9.

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[11] Hackney, C.T., M.H. Posey, S.W. Ross, and A.R. Norris. 1996. *A Review and Synthesis of Data on Surf Zone Fishes and Invertebrates in the South Atlantic Bight and the Potential Impacts from Beach Nourishment.* Prepared for the U.S. Army Corps of Engineers, Wilmington, NC.

[12] Section 5.08.2 of DEIS – p. 75

**EPA Recommendation:** EPA recommends that the FEIS include an EJ analysis that includes descriptions of the local demographics and identifies low-income and minority populations that have the potential to be impacted by the proposed action. Should the demographic analysis identify minority and low-income populations, the FEIS should describe efforts made to meaningfully engage these populations in the decision-making process. In addition, EPA recommends the FEIS identify communities with EJ concerns that may engage in subsistence activities within the project area (i.e., subsistence fishing). A summary of EJ comments or concerns identified during the public involvement process along with agency responses to those concerns and efforts to avoid, minimize or mitigate potential impacts should also be included in the FEIS.

Environmental Commitments and Record of Decision (ROD)

EPA recommends that general repair, maintenance, inspection, monitoring requirements, and environmental commitments being made by the project sponsor and the Corps be documented in the ROD. The ROD should also clearly outline adaptive management plan commitments for the 50 year life of the project.

Editorial Comments

- List of acronyms and abbreviations should be provided for main document and all appendices.
- Several tables and graphs in the appendices have no table or figure numbers and are not clearly relatable back to text. (example p. 60-77 of Appendix B)
- Page 12: Lobate sand. Not defined.
- Page 13: ppt not defined.
- Page 13: EPA recommends addition clarification in the FEIS as to which areas or parts of Bogue Sound are SB, SC & SA HQW
- Page 14: EPA recommends additional details regarding drinking water source for residents on Bogue Banks be added to this section.
- Page 15. Last check on attainment status was 11/26/2010.
- Several Reports cited in DEIS are dated:
    - Page 15: Marine environment draft report from 2002 (USFWS)
    - Page 16: benthic sampling in 2000
    - Page 22: EFH reports from 2001
    - Pages 28 and 29: Discussions regarding Maritime forest, Beach and Dune areas, and other vegetation discussions referenced to 2002 USFWS report
    - Pages 30 and 31: Discussions regarding birds are from 1985 and 2002
    - EPA is concerned that these
- Page 40: Table 2.6 Pine Knoll Shores lost population between 2000 and 2010 (i.e., 1,524 to 1,337). EPA recommends providing explanation for this decrease is provided (all other populations trends showed a substantial increase during the same period).
- Page 49: Key general assumptions: "near full development" for the purposes of economic modeling. No additional shorefront development will be occurring. EPA recommends

providing the actual land use data (required in 5-year CAMA plans) supporting this assumption.

- Page 50: Historic trends of FEMA emergency beach renourishment actions are not provided in DEIS. The assumption that this trend would/would not continue into the future or be part of the alternatives and decision-making process is an important missing element in this discussion of 'key general assumptions'. EPA recommends providing this information in the FEIS.
- Page 51: '*Monte Carlo simulation*' not explained. EPA recommends providing a description of *Monte Carlo simulation* in the FEIS.
- Pages 52 and 53: Within economic reach 21-41, the Corps does not provide information as to why this area is not showing significant erosion or accretion rates. EPA recommends clarifying this in the FEIS.
- Page 53: '*300 Life-cycles*' not defined or explained. EPA recommends clarifying this in the FEIS.
- Page 56: Section 4.07: Pine Knoll Shores lost population between 2000 and 2010 (i.e., 1,524 to 1,337). No explanation for this decrease is provided in the context of the Carteret County population increase projection. EPA recommends clarifying this in the FEIS.